L. L. Cabinet — from the Editor.

THE ADVOCATE OF SCIENCE.

Vol. 1.] KNOWLEDGE IS POWER—HAPPINESS—VIRTUE. [Nos. 15 & 16.

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For the Advocate of Science.

GEOLOGY, No. 10.

Recapitulation.—Chalk is the highest secondary stratum. It is nearly horizontal in its position, showing that it was formed since the mountains. It is the repository of flint. Its scenery is peculiar, and it causes a barren soil. No chalk in the United States. The *tertiary* class occurs in beds or patches, formed on the borders of continents, and in ancient lakes. Principally composed of shells, or shelly limestone, sand and clay. The Paris Basin described, and the singular alternation of salt and fresh water formations explained. Abounds in fossils, six hundred different species having been found in a single formation. A few bones of birds found in the tertiary strata. The southeast coast of the United States is tertiary, as also the western coast of France and the sands of Africa &c.

Alluvial and diluvial classes.—Having completed my cursory sketch of the primary, transition, secondary and tertiary classes, I will now proceed to give a brief account of the diluvial and alluvial classes.

The term *diluvial* applies to those depositions that appear to have resulted from the sudden and powerful action of extensive floods, and inundating torrents of water, which have swept over the face of the present continents, excavated new valleys, torn off the summits of the loftiest mountains, and transported immense fragments of their ruins into distant countries. By alluvial deposits is understood those more gradually formed, composed of soil, sand, & fragments, brought down by rivers, and spread along their banks, or at their mouths, on the borders of the sea, or of lakes. Diluvial strata have therefore been formed by floods, alluvial by rivers.

Mode of detecting the two classes.—The nature of the deposit, whether it has been made by the one or other of these causes can very easily be ascertained by slight inspection. If you observe a bed of gravel containing blocks of rock, or fragments belonging to a stratum foreign to the district in which these fragments are found, it is evident that nothing short of an overwhelming flood could have accomplished the operation of their removal from the present mass, and their transportation to so great a distance. On the other hand, it is evident that a bed of fine mould, devoid of the least stone or pebble, must have resulted from the deposition of sediment from the undisturbed waters of some placid stream.

The two classes to be examined connectedly.—As these two kinds of formations so nearly resemble each other in many respects, I do not think it necessary to treat of them under distinct heads, but shall occasionally connect them together, as convenience of arrangement may dictate.

Method of treating the subject.—By first considering the causes that are at present active in wearing down mountains, and tearing to pieces the ancient strata of solid rock, we shall be better qualified to form an idea of the effects accomplished by mighty inundations, the accounts of which are recorded on the page of history, as well as in the great book of nature which we are engaged in examining. I will introduce these illustrations with the fall of Mount Grenier, situated in the vicinity of the European Alps, where the operation of the elements in the destruction of elevated masses is most strikingly exemplified.

Fall of Mount Grenier described.—Mount Grenier rises very abruptly 40000 feet above an extensive plain, in which it stands entirely alone. Its summit is an enormous mass of limestone, piled up almost like a wall, which rests on a foundation of slate, or some other soft stratum. In the year 1248 the superior rock had become undermined by the action of water, so that a great body of it separated from the mass and rushed impetuously into the plain below, overwhelming five parishes, with the town and church of St. Andre, and covering the country for three or four miles in extent, with rounded hills thirty or forty feet in height. So effectually was the town at the base of the mountain immured in the ruins from above, that up to this day no vestige of its existence has been discovered, except a small bronze statue. The velocity acquired by this falling mass has been estimated at not less than three hundred feet in a second of time. At this very moment there is a large body of the same mountain separated from the rest by a vast chasm, and undermined, apparently preparing to renew the awful catastrophe.

Fall of another mountain.—Not very far from Mount Grenier, at the foot of one of these alpine hills, was the town of Pleurs, containing many noble palaces, owned by the opulent citizens of Milan. On the 26th of August, 1818, an inhabitant entered the city in great haste and alarm, and told that he had seen the mountains above, cleaving, and about to fall. The inhabitants were incredulous, and laughed at him for his pains, and remaining in the town, the mountain suddenly gave way in the evening, and crushed them beneath its ruins. Not a soul, out of a population of 2008, escaped to relate the melancholy tale, except the man who had warned them of their danger.

Action of frost in wearing down mountains.—Frost has a powerful agency in the destruction of mountains. The fissures of the rocks are penetrated by water, and the freezing of this acts like a wedge in loosening them. The cliffs of the Alps often present to the traveller a fearful aspect on that account, so that he is careful to make no noise that may agitate the air and produce their downfall. The firing of a pistol, or even speaking aloud in such circumstances, might bring down to his destruction the impending masses.

Undermining of mountains.—Another cause contributes much to the destruction of the Alpine mountains. The soft and crumbling slate rocks form large hollows or basins high on their declivities, which become filled with water by the melting of the snow and other causes. At length some weak part of the barrier is overcome, and the great body of water is at once precipitated, with indescribable force, and rushing impetuously down the rocky steep, like a moving wall, tears away large masses, sweeps off edifices, uproots the stoutest trees, and spread destruction in the valley beneath by deluging it with sludge, gravel, and fragments of rocks. In 1757 a circumstance of this kind took place, when a great part of a mountain, with three lakes at its summit, gave way, and fell with a tremendous crush. The masses of rocks then hurled down amounted to three millions of cubic feet, almost sufficient in bulk to have crushed completely the whole city of Philadelphia.

Glaciers and avalanches.—There is yet another cause of considerable importance in contributing to the destruction of the Alps and some other mountains. I allude to the glaciers and avalanches. The glaciers are composed of great masses of snow and ice, sometimes of the immense extent of forty miles long, three broad, and from eighty to one hundred feet thick. While the frozen material is accumulating at top, the foundation of the glacier is melting with the warmth of the earth, until finally the whole mass, or part of it, dashes down from the mountain, crushing and sweeping away every thing that opposes its course. The celebrated Saussure states that during his stay of some weeks in the neighborhood, he did not pass an hour without seeing or hearing an avalanche precipitated, with a noise like thunder, from Mount Blanc, or the neighboring heights. Sixty years previously, the houses and cattle in the valley beneath were buried by an enormous avalanche, which, the same writer tells us, had during the whole intervening time, constantly continued to pour down. Occasionally, vast fissures and chasms are formed on the glaciers by their cracking, and subsequently filled with fresh snow, which lures the traveller to destruction by its smooth and unbroken surface. In this way, guides have often lost their lives.

Similar catastrophe in the White Mountains of New Hampshire.—But there

is no necessity of travelling beyond the limits of our own country to find illustrations of the powerful effects of sudden floods and torrents. In the Green Mountains of Vermont, and in the White Mountains of New Hampshire, occurrences similar to those detailed respecting the Alps, are not unfrequent. The most remarkable of these which is recorded, took place in the White Mountains in the summer of 1826. In the course of the Saco, which is described as a wild roaring river, is a narrow defile, with mountains rising abrubtly on either side for several miles. In this lonely and wild spot, a habitation had been erected near the bank of the river, which was occupied by a family named Willey, and used as a resting place for travellers. A violent storm occurred on the 28th of August, accompanied with torrents of rain. It was night, impenetrably dark, and frightfully tempestuous—the solitary family, nine in number, had retired to rest in their humble dwelling, six miles from the nearest human creature. An enormous mass of earth and rocks parted from the summit of the mountain, immediately above, and came rushing down, mingled with great volleys of water, directly towards the house; but having arrived within six feet of the building, it divided just behind it and passed on either side, sweeping away the stable and horses, and uniting again below, leaving the house untouched. At this time it is supposed the family fled from the house, and were swept away in the torrent. Had they remained they would have been perfectly safe. Amidst the war of wind and rain and mountain torrents, and the tremendous crash of forests, earth and rocks, which for miles around were rushing down in one wide field of desolation, this humble edifice remained unharmed; and a flock of sheep which had rested on a little green immediately in front of the house, were found there in safety the next morning.

There remains to be considered other causes which are operative in the production of beds or partial strata, and in the accomplishment of important changes in the geological condition of the surface of the earth. Rivers, tides, and oceanic inundations are among these. In my next number, I will resume the subject. S.

For the Advocate of Science.

BIOGRAPHICAL SKETCH OF A CROW.

In the latter part of the last century, there lived a famous crow, which was maintained and educated by William Bartram, of Pennsylvania. This bird was known to many in those days by the appellation of "Bartram's crow.' He was certainly one of the most sagacious of the family of crows, and was well worthy to be immortalized by the following history, written by the veracious and esteemed naturalist who reared him.

It is a difficult task to give a history of our crow. And I hesitate not to aver, that it would require the pen of a very able biographer to do justice to his talents.

Before I enter on this subject minutely, it may be necessary to remark, that we do not here speak of the crow, collectively, as giving an account of the whole race (since I am convinced that these birds differ as widely as men do from each other, in point of talents and acquirements,) but of a particular bird of that species, which I reared from the nest.

He was, for a long time, comparatively a helpless, dependent creature, having a very small degree of activity or vivacity, every sense seeming to be asleep, or in embryo, until he had nearly attained his finished dimensions, and figure, and the use of all his members. Then we were surprised, and daily amused with the progressive developement of his senses, expanding and maturing as the wings of the youthful phalæna, when disengaged from its nymph shell.

These senses, however, seemed, as in man, to be only the organs or instruments of his intellectual powers, and of their effects, as directed towards the accomplishment of various designs, and the gratification of the passions.

This was a bird of a happy temper, and good disposition. He was tractable and benevolent, docile and humble, whilst his genius demonstrated extraordinary acuteness, and lively sensations. All these good qualities were greatly in his favor, for they procured him friends and patrons, even among *men*, whose society and regard contributed to illustrate the powers of his understanding. But what appeared most extraordinary, he seemed to have the wit to select and treasure up in his mind, and the sagacity to practise, that kind of knowledge which procured him the most advantage and profit.

He had great talents, and a strong propensity to imitation. When I was engaged in weeding in the garden, he would often fly to me, and, after very attentively observing me in pulling up the small weeds and grass, he would fall to work, and with his strong beak, pluck up the grass; and the more so, when I complimented him with encouraging expressions. He enjoyed great pleasure and amusement in seeing me write, and would attempt to take the pen out of my hand, and my spectacles from my nose. The latter article he was so pleased with, that I found it necessary to put them out of his reach, when I had done using them. But one time in particular, having left them a moment, the crow being then out of my sight, recollecting the bird's mischievous tricks, I returned quickly, and found him upon the table, rifling my inkstand, books, and paper. When he saw me coming, he took up my spectacles and flew off with them. I found it vain to pretend to overtake him; but standing to observe his operations with my spectacles, I saw him settle down at the root of an apple tree, where after amusing himself for awhile, I observed, that he was hiding them in the grass and covering them with chips and sticks, often looking round about, to see whether I was watching him. When he thought he had sufficiently secreted them, he turned about, advancing towards me, at my call. When he had come near me, I ran towards the tree, to regain my property. But he, judging of my intentions by my actions, flew, and arriving there before me, picked them up again, and flew off with them into another apple tree. I now almost despaired of ever getting them again. However, I returned back to a house a little distance off, and there secreting myself, I had a full view of him, and waited to see the event. After some time had elapsed, during which I heard a great noise and talk from him, of which I understood not a word, he left the tree, with my spectacles dangling in his mouth, and alighted with them on the ground. After some time and a great deal of caution and contrivance in choosing and rejecting different places, he hid them again, as he thought very effectually, in the grass, carrying and placing over them chips, dry leaves &c., and often pushing them down with his bill. After he had finished this work, he flew up into a tree, hard by, and there continued a long time, talking to himself, and making much noise; bragging, as I supposed, of his achievements. At last he returned to the house, where not finding me, he betook himself to other amusements. Having noted the place where he had hid my spectacles, I hastened thither, and after some time recovered them.

This bird had an excellent memory. He soon learned the name which we had given him, which was Tom; and would commonly come when he was called, unless engaged in some favorite amusement, or soon after correction: for when he had run to great lengths in mischief, I was under the necessity of whipping him; which I did with a little switch. He would, in general, bear correction with wonderful patience and humility, supplicating with piteous and penitent cries and actions. But sometimes, when chastisement became intolerable, he would suddenly start off, and take refuge in the next tree. Here he would console himself with chattering, and adjusting his feathers, if he was not lucky enough to carry off with him some of my property, such as a penknife, or a piece of paper; in this case, he would boast and brag very loudly. At other times he would soon return, and with every token of penitence and submission, approach me for forgiveness and reconciliation. On these occasions, he would sometimes return and settle on the

ground near my feet, and diffidently advance, with soft soothing expressions, and a sort of circumlocution; and sit silently by me, for a considerable time. At other times, he would contently come and settle upon my shoulder, and there solicit my favor and pardon, with soothing expressions, and caressing expressions, and caressing gesticulations, not omitting to tickle me about the neck, ears &c.

Tom appeared to be influenced by a lively sense of domination, an attribute prevalent in the animal creation: but, nevertheless, his ambition, in this respect, seemed to be moderated by a degree of reason, or reflection. He was, certainly, by no means tyrannical, or cruel. It must be confessed, however, that he aimed to be master of every animal around him in order to secure his independence and his self preservation, and for the acquisition and defence of his natural rights. Yet in general he was peaceable and social with all the animals about him. He was the most troublesome and teazing to a large dog, whom he could never conquer. This old dog, from natural fidelity, and a particular attachment, commonly lay down near me, when I was at rest, reading or writing under the shade of a pear tree, in the garden, near the house. Tom (I believe from a passion of jealousy) would approach me with his usual caresses and flattery, and after securing my notice and regard, would address the dog in some degree of complaisance, and by words and actions; and, if he could obtain access to him, would tickle him with his bill, jump upon him, and compose himself for a little while. It was evident, however, that this seeming sociability was mere artifice to gain an opportunity to practise some mischievous trick; for no sooner did he observe the old dog to be dozing, than he would be sure to pinch his ears, and pluck his beard. At length, however, these bold and hazardous achievements had nearly cost him his life; for, one time, the dog being highly provoked, he made so sudden and fierce a snap, that the crow narrowly escaped with his head. After this, Tom was wary, and used every caution and deliberation in his approaches, examining the dog's eyes and movements, to be sure that he was really asleep, and at last would venture nearer than his tail, and then by slow, silent, and wary steps, in a sideways, or oblique manner, spreading his wings, and reaching forward. In this position he would pluck the long hairs of the dog's tail. But he would always take care to place his feet in such a manner as to be ready to start off, when the dog was roused and snapped at him.

It would be endless to recount instances of this bird's understanding, cunning, and operations, which certainly exhibited indigestible demonstrations of a regular combination of ideas, meditation, reflection, and contrivance, which influenced his operations."

For the Advocate of Science.

THE OURANG OUTANG—Simia *satyres.*

Some have supposed this animal to be the prototype of the fauns, satyres, pans, and sileni, which the ancient poets so finely described, and whose forms have been transmitted to us by the painters and sculptors of antiquity with such essential variations and improvements as a moderate fancy saw proper to create. Mr. Pennant, however, conceives the satyrs of the ancients to be a species of monkey, and not the same as this animal, since Ælian and Ptolomy affirm that they have tails. I will not assume an umpirage in the case, but if any of my readers are curious on the point, I will remind them that, time was, when a tail was considered no small ornament to the almost perfect figure of man. Ælian, moreover, alleges, that Silenus was not a god, though a superior being. (Silenus was the oldest of the sileni, who were the same with the satyrs, and so called when they arrived at an advanced age.) Diodorus Siculus says he was the master or tutor of Bacchus; and his long tail is said to be an attribute of all his posterity. Whether a god, or a demi-god, or even something inferior to this, certain it is he was a very distinguished personage: and as such, we must give him a tail, if tails were fashionable in those days, and necessary to the consummation of human glory: for certainly an experienced painter, or sculptor, could find no difficulty in manufacturing one to order. But I am straying from the subject.

It is said, when Alexander was in India, pursuing his conquests, he saw a troop of ourang outangs, and mistaking them for some of his less peaceable enemies, prepared his army for an engagement. Hanno also made an attack on a large body, in an island on the coast of Africa, where his united forces captured *three of the females*, whose skins were deposited in the temple of Juno, and there found by the Romans, at the taking of Carthage. From these circumstances we may infer they are less numerous at present, than they formerly were.

Of all animals, the ourang outang is considered as approaching nearest to man, in the form and structure of his head, and volume of brain. He can walk like him, in an upright posture, though the formation of its hands and feet, when examined with anatomical accuracy, seem to prove nature had designed him for walking on all four's. It inhabits the most eastern countries only, as Malabar, Cochin China, and more particularly the island of Borneo.

There is a striking difference in their manners, when in a free condition, and in a state of captivity. In the former, they are considered a dangerous and ferocious animal: their swiftness being equal to their strength; and, for this reason, they can rarely be obtained at a full grown size. They sleep in trees, and shelter themselves from the inclemency of the weather. When tame, they become mild and docile, their appearance grave, and their disposition melancholy; they may be taught to perform a variety of actions in domestic life. Buffon relates that he had seen this animal offer his hand to those who came to see him, and walk with them as if he had been one of their company; he would sit at table, unfold his napkin, wipe his lips, make use of his knife and fork, pour out his drink into a glass, take his cup and saucer, put in sugar, pour out the tea and stir it, in order to let it cool; and all this, not only at the command of his master, but often without bidding. He did no kind of mischief, and offered himself to be caressed by strangers. He preferred dried ripe fruit to every other kind. A traveller relates that he had seen a female of this species, at Java, who made its own bed regularly every morning, and at night she would lay down with her head on the bolster, and cover herself with the quilt. When her head ached, she would wrap a handkerchief round it. The following interesting account of one which was taken into Holland in 1776, and presented to the Prince of Orange, is given by M. Vosmaer:—

This animal was in height about two Rhenish feet and a half. It showed no fierceness or malignity, and was even of a melancholy appearance. It was fond of being in company, and showed a preference to those who daily took care of it, of which it seemed to be very sensible. Often when they retired, it would throw itself on the ground, as if in despair, uttering lamentable cries. Its keeper having been accustomed sometimes to sit near it on the ground, it would take the hay of its bed and spread it in the form of a cushion, or a seat, and with every demonstration, invite its keeper to sit with it. Its usual manner of walking was on all four's, but it could also walk on its two hind feet. One morning it got unchained, and we beheld it with wonderful agility ascend the beams and rafters of the building; it was not without some trouble it was taken, and we then remarked the prodigious strength of the animal, the assistance of four men being necessary, in order to hold it in such a manner as to be properly secured. During its state of liberty, it had, among other things, taken the cork from a bottle of Ma-

laga wine, which it drank to the last drop, and had set the bottle in its place again. When presented with strawberries on a plate, of which it was extremely fond, it was very amusing to see it take them up one by one, with a fork, and put them into its mouth. Its common drink was water, but it also willingly drank all sorts of wine, but preferred Malaga. After eating, it always wiped its mouth, and when presented with a toothpick, always used it in a proper manner. This animal lived seven months in Holland, and was brought from the island of Borneo.

When it first arrived, it had little hair, except on its back and arms, but on the approach of winter, it became well covered, the hair on its back being full three inches in length. The whole animal was of a chestnut hue, the skin of the face of a mouse color, but about the eyes and round the mouth it was of a dull flesh color. None of these animals which have been brought into Europe have been more than three feet high, and most have been under that size. Of eight, seen by Dr. Camper, late Professor of Astronomy &c., in the University of Gronengen, none exceeded two and a half feet (Rhynald measure.)

This gentleman having dissected the whole organ of voice in the orang, apes, and several monkeys, concludes that orangs and apes are not made to modulate the voice like men: for the air passing by the *rima glottidis* is immediately lost in the ventricles or ventricle of the neck, as in apes and monkeys, and must consequently return from thence without any force and melody within the throat and mouth of these creatures. And this seems to be the most evident proof of the incapacity of these animals to utter any modulated voice, as indeed they have never been observed to do. *See* Phil. Trans. vol. lxix. part i. art. 14.

The ourang outang has generally been confounded by naturalists with the Simia *troglodytes*,* (called *Kimpanzay*, in Congo, *chimpanse*, *Cuv.*) Some travellers state this animal to be in stature superior to man; but this great size cannot be granted to it, judging from the parts which have been seen in Europe. Though it is said to have less resemblance to man than the ourang outang, yet it surpasses him in intelligence. To it is to be attributed the surprising actions for which the ourang outang has received credit, such as making their attacks on women, especially such as carry provisions, and beating them with sticks till they drop their burden. They will drive away elephants by practising the pugilistic art, as well as the club system upon them, and throw stones at people who offend them. When pursued and attacked, they defend themselves by hurling stones, and biting; and the females who have young ones to protect, are particularly fierce and courageous in their resistance. According to the account of a recent traveller, this animal is far from being common. JOCKO.

* Vid. M'Murtrie's Trans. Regne Animal, S. *troglodytes*.

For the Advocate of Science.

System or Classification.—No. 2.

In my first number I explained the seven orders of the first class of animals, *mammalia*. Descending in the scale of animal life, we next meet with the Aves or *bird* class. Linnæus and Cuvier unite in dividing this class into six orders, the first of which is Accipitres, or *birds of prey*, comprising the most formidable tenants of air. Among these are the greedy vulture, unrivalled in keenness of vision; the eagle, boasted sovereign of the winged creation, and the different species of hawks, against whose predacious habits, the field mouse in his burrow is not secure, nor the feathered inhabitant of the poultry yard, under the protection of man. Here also is the demure owl, the wise bird of Minerva, furnished, like the beasts of prey, with eyes fitted for the night, the better to subserve his appetite for mice. They all have a bill more or less hooked, and four hooked and sharp claws.

The second, is the most numerous order of the class. It is denominated by Linnæus, Picæ, or Pies, and by Cuvier, Climbers. A compressed and convex bill forms their distinguishing characteristic, with feet adapted either for perching, for climbing, or for walking. Many of them are celebrated for beauty of dress, for loquacity, and for longevity. The parrot family combines these three qualities. The beautiful humming bird, smallest of the feathered race, one species of which is not larger than a honey bee, forms a remarkable contest with the enormous toucan, whose uncouth bill is often longer than its body, and whose tongue is curiously tipped with a bundle of feathers. The splendid bird of paradise is here, and the loquacious family of crows—that dexterous angler, the kingfisher—the boney-tongued woodpecker, to whose penetrating labors in search of insects, we are said to be indebted for the peculiar structure of curled maple, and the unnatural cuckoo, who, putting in practice the creed of some modern reformers, to escape a mother's cares, trusts to the body politic the nurture of her offspring.

From this interesting group, we pass to the third order, of Anseres or *web-footed* birds, characterized by a broad pointed bill, covered with skin, a webbed foot for swimming, and a soft fleshy tongue. With many of these, as the duck, and goose tribes, we are familiar. The fish hawk also, and the pelican, are in this order, and the petrels, which defend themselves by ejecting from their mouth an oily liquor. The stormy petrel is the most adventurous of birds, though not larger than our common martin. On the appearance of a storm it issues from its rocky retreat, an omen to the anxious mariner, and wild with joy, darts amid the lightning's flash, and skims like an arrow the foaming surface of the stormy sea.

The fourth order composes the Grallæ, or *waders*, distinguished by a cylindric bill, and naked legs, constructed for wading. In this order, those most familiar to us are the heron and crane, which cut a grotesque figure with their long and slender legs, and the woodcock and snipe, well known to our sportsmen.

The Gallinæ or Gallinaceous birds constitute the fifth order, characterized by a convex bill, with the upper division arched. Our domestic fowls are of this order, and also the pheasant, partridge, and the ostrich. The latter cannot lift itself from the earth with its wings; but by using them in concert with its legs, can outstrip in speed any other running animal. The ostrich is said to be able to carry a man faster than the fleetest courser. Many of the gallinaceous birds swallow gravel and other hard substances with their food, to aid it in its trituration; and hence has arisen the notion that some of them can *digest stones* and *glass*.

The birds of the sixth and last order, called Passeres, are marked by a sharp, conical bill, and uncovered nostrils. They are mostly of a small size, consisting chiefly of birds of song, which it is unnecessary to enumerate. The most remarkable phenomenon they exhibit, is the quantity of sound they can emit with their small delicate organs.

Having now completed an outline of the orders contained in the two highest classes of animals, I proceed to the third class, styled by Linnæus, Amphibia. There is some difficulty in prescribing the limits of this division, when guided only by the meaning of the term. But by using a little force, it is made to consist of two orders, the first of which is *reptiles*, and the second *serpents*; the former distinguished by possessing feet, which do not belong to the latter. The most important genus of reptiles, Lacerta, or *lizard*, embracing the enormous crocodile and

tor, the chamelion, of changeful hue, and the little lizard of our own woods and thickets. To this genus belong several gigantic species, whose remains are dug up from beneath the earth's surface where they have lain entombed since the awful convulsions of nature that extinguished their species. The toirtoise and frog are also ranked with the amphibious reptiles.

The animals of the other order of AMPHIBIA, have ever been regarded by the human species with the utmost horror and detestation, or with the most superstitious dread: so that the serpent has held the station both of a deity, and of a demon. They include seven genera, in three of which, many of the species are poisonous—the CROTALUS, or *rattlesnake*, the COLUBER, or *viper*, and the BOA. The poisonous serpents may easily be distinguished from those that are harmless, by the hard plates on their bodies—the innocent ones being covered merely with thin flexible scales.

A singular faculty exercised by some of these animals, is the power of fascination, or charming, which they use for the purpose of entrapping birds and other objects of prey. Various are the conjectures advanced in order to explain this strange phenomenon. Some have ascribed it to fear on the part of the bird—others to a misguided anxiety for its young—some to electrical agency, and others to an intoxicating atmosphere emitted by the luring monster. In support of the latter hypothesis, an instance is recorded of a negro in South Carolina, whose olfactories could detect the presence of a rattlesnake in the act of charming a bird, at a considerable distance.

There have been instances of the exercise of a fascinating power by other animals than serpents. It is related of a man who lived in England some years ago, that he could subdue the wildest horse by a similar means. This man would shut himself up alone with an unmanageable horse for about half an hour, and then lead him out as docile as a lamb. He received the title of the Whisperer, from the supposition that he acquired his control over the animal by whispering in his ear. Some tribes of savages are said to handle with impunity the most poisonous serpents; but they probably make use of some stupifying herbs to protect their bodies. I once knew a coloured boy who professed to have the power of charming birds, by fixing his eye steadily upon them, and then approaching very gradually until close enough to seize them with his hand. Although his statement is a good deal problematical, yet the idea of the effect of the human eye in such a case, may have some foundation.

It appears to me that terror of the victim, offers the most reasonable solution of the phenomenon of fascination; for the animal exhibits evident symptoms of terror, when it finds itself in the power of its destroyer. It is related of a sheep that was thrust into the cage of the great Boa, brought from India some years since, that it stood for a few moments with its eyes fixed on the gaping jaws of the monster, and then, as if frantic with despair, rushed into its living tomb.

ARANEA.

THE ADVOCATE OF SCIENCE.

Seventh Month 4th, 1833.

Owing to our indisposition, a greater number of errors *than usual* remained uncorrected in our last paper, having escaped notice till it was too late to rectify them. On page 42, head of the article, for "System *of* Classification," read "System, *or* Classification." On page 45, second paragraph from the end of the article on embalming, for "A leg was shown, of which *the muscular part of the calf* was entirely composed of bandages, and *found* so natural" &c., read "A leg was shown, of which *the calf* was entirely composed of bandages, and *formed* so natural" &c. The last paragraph of next column, for "MUSCA *carnivra*," read "MUSCA *carnaria*."

ANSWERS TO "BARBARA."

1. "Why does a cloud in the west precede a storm in the east."

There are often several currents of air proved to exist at the same time by the motion of the clouds. In the storms referred to, this is always the case; the upper stratum or current coming from the south or west, and the lower one, which determines our idea of the direction of the storm, coming from the east. In the commencement of an easterly storm, before the view is obscured by the falling of rain, we can generally perceive these two currents. The main body of cloud forming a continuous stratum high in the atmosphere, and moving from west to south-west; while below this, are fragments of cloud, called *scud*, coming from the east or north-east, and corresponding in their course to the direction of the wind on the surface of the earth.

An easterly storm is a more complicated and systematic phenomenon than is generally supposed. The theory of it is this. In the tropical regions, the rarefying action of the solar heat produces a continual current of air, ascending in consequence of its levity. The column of air thus becomes elevated in this situation, and of course flows over at the top, towards the north and south; that which flows over at the north, forming eventually the upper current of our easterly storms. The tropical air mingling with that which is colder, in its passage northward, gives rise to the formation of clouds; and this is the cloud which we observe in the west or south, presaging a storm from the opposite quarter.

So much for the upper current. We must in the next place start a lower current in the contrary direction. This is accomplished by the air on the surface of the earth, to the north and to the south of the tropical regions flowing in to supply the place of the ascending current. It follows that a northerly or a north-easterly wind is produced in the northern hemisphere. This wind is first felt nearest the tropics. It constitutes the lower current of the storm, in which the scud is seen.

The formation of these two opposite currents is well illustrated by the simile of a heated chamber. The warmed air rises and flows out by the tops of the door and windows, representing the higher southerly current. The cold air outside flows in at the bottom of the door, representing the lower northerly or easterly current.

2. "Why do our snow storms from the northeast begin in the south, and advance northward against the wind?"

We presume our readers are able to answer this, on the facts just presented. The storm begins where its cause begins to operate, and this is at the south. It is mostly the upper cloud which furnishes the rain or snow, so that in reality the *rain* or *snow* of a northeast storm comes from the southwest, while the *wind* forming the *lower current*, through which it falls, blows in an opposite course.

3. "Why is a *clear-off* in the night less permanent than when it clears off in the day?"

Before we puzzle our brains with this question, we will examine whether such is the fact. By referring to our tables, we find that in the first five months of this year, it cleared off sixteen times in the day, and seventeen times by night; the average duration of clear weather after the former, was two days—after the latter, two and a

half days. In the last four months of last year, it cleared off twenty times by day, and only four or five times by night; the average number of clear days after the former being nine, and after the latter being twelve. The difference in these cases is probably merely incidental. For ourselves, we believe that there is no truth in the common remark on which the question is founded.

4. "Why does it continue clear for a longer time when the wind goes round by the south, than when it goes round by the north?"

We do not believe it does; and our opinion is the result of an appeal to *facts*, which we made some time since. But as the particular result is not now in our possession, we will make another examination of our meteorological register when at leisure, and furnish the summary to our readers.

5. "Why are the indications furnished by a rainbow in the morning so opposite to those of a rainbow in the evening?"

A rainbow in the morning shows that the eastern horizon is clear while the western sky is clouded. Our rains generally proceed from the south and west, and therefore the morning bow shows the *approach* of clouds or rain. On the other hand, the evening bow indicates a clear western horizon, and consequently that the cloud has ceased to be formed in that quarter from which the rain comes.

6. "Why does a clear sunset portend a fair morning?"

The answer to the fifth question applies also to this. A clear sunset indicates an absence of clouds in that quarter from which our rain clouds are generally derived.

For the Advocate of Science.

AMERICAN SCIENCE AND LITERATURE.—No. 4.

There is no pursuit which imparts a more happy tone to the life of man, than the proper study of the sciences. While it endows him with liberal principles, and such as become the creatures of his name; while it raises the veil of mystery from the view of operating nature, and fills the soul with enchantment by its grandeur, it carries with it undeniable evidence of the immediate agency of a First Great Cause.

But science is often imperfectly studied, either from a want of capacity to appreciate its importance, or from the absence of an energy and patience indispensible to those who enter as laborers, in the golden field. From such as may be classed under the former head, and denominated *amateurs*, but little good can be reasonably expected; while from the latter, who are justly termed *empirics*, much injury to a good cause is sustained. Of these last I will reserve my remarks for a future essay, contenting myself at present with a few observations on the *amateur*.

The difference between him and the real disciple of science is plainly seen. The one contents himself with amassing the beautiful and attractive productions of art and nature, without system and without order. The other, building his hopes on these rejected principles, not only can admire what he sees and gathers, but to each individual part can assign its respective station in nature's perfect scheme.

The one brings in the spotless marbles of Italy, sculptured by her ablest artists, to accupy a prominent station in his rooms. The stalactytes of Antiparos, and the spars of England, are arranged within his parlor, to feast the vision and not to improve the intellect. The other, whose eye has learned deeply to penetrate into the mysteries of science, can see as much to interest, and more to instruct him in the small fragment of stone he gathers by the way side, as the amateur, in the midst of all his collections.

The one has his cabinet stocked with splendid shells from the waters of the old world, and he may tell you where they were obtained, and what animals inhabited the beautiful domiciles: further than this his knowledge does not go. The other, standing in a valley or on a mountain, picks up a rusty shell incrusted with mud and dirt,—such as his more particular neighbor would despise, and from a mere inspection, recite the history of an age when man held not dominion over the soil.

Thus can a broad line of distinction be seen, however we compare them together. And every interested friend of science must regret, that while a decided fondness for some portion of the natural world is entertained in almost every mind, that mental activity, which would prompt them to investigate the history of all that comes under their observation, is too often buried beneath the obnoxious customs of the times.

I have said that which is a distinguishing feature in the character of the amateur, is his fondness for collecting the beautiful and rare. The spirit of investigation never enters into his system. Or, to speak in phrenological language, without saying I am one of the faith, his organ of acquisitiveness is perfectly developed, while those of individuality and casuality are not sufficiently so, to cooperate successfully with it.

But for this, science might receive invaluable acquisitions from his hands. And instead of the splendid schemes he conjures up, of establishing new museums and new institutions, which shall immortalize his name, he would be content to walk hand in hand with his less aspiring, but more useful brethren: and his collections being deposited in the cabinet of a suitable association, would not be permitted to deterioate in value by neglect; nor would they subserve the purposes of our active little housemate, the mouse, who has no objections to making a castle for its family among the choicest minerals, or the most beautiful shells.

With this humble resignation of speculative greatness,—for no better name can be given it,—he need not fear, lest his vanity would not be flattered, for the tale of his wisdom would be told, and known in the world, notwithstanding no splendid edifice has been specially dedicated to perpetuate the remembrance of such an event.

W.

For the Advocate of Science.

It being more easy to raise objections to theories not well established, than to form new ones which will be invulnerable, I shall leave the consideration of the causes that operate in producing Indian summer, and other periods of hazy weather, to Boreas, or his friends. If we are to place implicit confidence in his table, in opposition to the generally received opinions, respecting the height of the barometer, direction of the wind &c., as I have hitherto represented, then I will suffer my theory to be "blown away like smoke," but not previously.

The information afforded by Boreas, that carbon, hydrogen, and water, are emitted by growing vegetables, is indeed quite sufficient to make one "open his eyes," and before he proves this, he will *have* to *shut* his eyes. That carbon, a solid and fixed elementary principle, is capable of being in the gaseous form, so as to be emitted from vegetables, is indeed quite new. It is granted that carbon, in a state of combination with oxygen, (carbonic acid gas) is emitted; but there is just as much difference between this com-

pound and carbon, as there is between sulphuric acid and sulphur, its basis. The same observations will apply to the hydrogen, which is emitted from vegetables only in a decaying state, and is then in combination with carbon. Now these compounds, carbonic acid gas, and carburetted hydrogen, will be found to resist chemical agencies very differently from carbon and hydrogen; and while I defy smoke to be produced from the former, I should wish to be preserved from an atmosphere loaded with *carbon vapor*, and hydrogen gas, which, indeed, by one stream of the electric fluid, would produce more smoke than perhaps Boreas may imagine, and an explosion that would rend the very firmament.

I should be pleased to hear from Boreas in what way the change can possibly take place, in the compound substances emitted from vegetables, so as to form pyroligneous acid, as he is pleased to term smoke, and request that he will not substitute the elements of these emissions for the emitted substances. If he will do this satisfactorily, I shall endeavor to inform him of the formation of meteoric stones.

JUVENIS.

For the Advocate of Science.

PRESERVATION OF WOOD FROM THE DRY ROT.—For many years, the attention of chemists and others has been directed to the discovery of some means to prevent the peculiar decay of wood, called *dry rot*. According to some recent experiments cited in a lecture of the eminent English chemist, M. Faraday, the *deutochloride of mercury*, or corrosive sublimate, has been found to remedy the evil. The dry rot has caused an immense destruction of property in the British navy, and the ships of other nations, as well as in buildings. Should this remedy prove as effectual as it promises, it will save to those interested millions and millions of dollars.

The following is an extract from the lecture spoken of, describing a pit in which the experiment was tried &c.:—

"The 'fungus pit' at Woolwich, is a subterranean chamber, lined with wood in the first possible stages of corruption; it is kept extremely damp, generates carbonic acid gas in profusion, and in short, forms, as its name implies, a perfect hot bed for the growth of all those fungi that used to be considered as the causes, but which are only the most usual symptoms of dry rot. It is a proverb among the people of the dockyard, that a month in *the hole* is worse for a bit of timber, than ten years in almost any possible situation out of it;—and the government, pestered with the eternal applications of the Rot-doctors, have hitherto found their safety valve in this fungus pit. Mr. Knowles concludes one of his chapters with a distinct statement that no prepared timber, exposed during twelve months to the action of this ordeal, had, unless insulated by some other substance, 'entirely resisted the influence of the gas.' We have ourselves visited this noxious place, and seen an hour and a half elapse, after opening the trap door, before a candle would burn six inches beneath the surface.—Blocks of timber—oak, elm, pine, beech &c.—prepared with the solution of sublimate, have now, as Mr. Faraday said, and as the printed documents before us prove distinctly, stood the test of the fungus pit, without exhibiting the slightest symptom of decay, during no less a period some of them than *five years;* and these instead of being insulated by means of some heterogeneous substance, had been lying on the fungus-spread floor of the dungeon, each with an unmedicated fragment of the very same tree, and of the like bulk, close by its side—every one of which unprepared pieces was found at the opening of the pit, in rapid progress to decomposition. The results of various experiments, instituted by Sir Robert Smirke the eminent architect, with a view to his own professional business, were in a like manner detailed, and his evidence as to the power of timbers prepared in this method to resist the action of dropping eaves &c. during a course of time sufficient to bring utter decay upon unprepared ones similarly exposed, was not less satisfactory than the upshot of the long trials at Woolwich.

"The *prima facie* efficacy of the application was illustrated, as some thought, even more remarkably, by the exhibition of pieces of canvass, and even of delicate calico cloth, which had been placed during from two to three months on the floor of the fungus pit. The prepared pieces came out entirely sound, while of the unmedicated counterparts, there remained nothing but a few mildewed strings that fell to pieces at the touch.

"The lecturer stated, on the authority of Mr. Kyan, that cubes of oak, Memel pine &c., containing each 216 cubical inches, imbibe, notwithstanding the difference of their structures, as nearly as can be measured, the very same quantity of the solution—about five ounces each; a quantity so small, that the expense of the operation is a mere trifle compared with the result. The process is of course rapid in a plank, compared with a solid log. Fir deals take in their quantum within forty-eight hours—a beam of oak is not saturated under a month; but what is a month, when we think of the years always considered necessary for the seasoning of timber in the usual process of drying?"

To the Editor of the Advocate of Science.

SIR—By answering the following Questions, you will much oblige a reader of your paper.

To what cause do you attribute what is commonly called the "shooting of a star?"

Why does the moon sometimes appear larger on its first appearance above the horizon, than when in the midheaven?

Why are the auroras often succeeded by an easterly storm?

A QUERIST.

For the Advocate of Science.

A SCIENTIFIC RAMBLE.—No. 4.

Louis. If my brother John will promise not to laugh at me, I will say why I am really somewhat afraid of scratching through this thicket.

John. My laughing propensity is not always under my complete control. But I will promise to look as grave as an owl if I can.

Louis. Well then, to tell the truth, I have a reasonable fear of snakes. I never saw so many of these poisonous *snake servants* in my life, as I have to day in our walk.

John. True, I myself have several times thought of asking our father about these dandy looking animals. I am puzzled to divine why they should take such a fancy to snakes.

Father. You both labor under a common error in supposing that there is any connexion between the two animals. The fly you observe is the *dragon-fly*. You are deceived by the vulgar name of it. It is apt to frequent ponds and rivulets, flying over the surface of the water, and perching on the objects near. Snakes also frequent such situations, and from this coincidence the erroneous idea of the fly being a servant of the snake, bringing it food and so forth, has originated.

Louis. And is not the dragon-fly a poisonous, or stinging insect?

Father. By no means. If you will catch one, you may convince yourself of that in a moment.

Louis. I should as soon think of catching a bird. They will never permit me to come within a rod of them.

Father. The only mode of catching them is to move very slowly and gradually towards the insect as it sits perched on a shrub, and approach the hand to it in the same cautious manner until you get its wing between your thumb and finger. Then slowly take hold of its wing. If you make a single sudden movement, the insect takes flight. The operation must be conducted in a very steady and deliberate way.

John. I have seen a cat approach a bird in the same mode, creeping along quietly till within springing distance. Indeed I remember to have caught a mouse once in that way myself. The animal stepped out of its nest one evening, and stood on a box in the corner of the room, gaping at the company. With as little perceptible motion as

possible, I advanced to the place, and then, with as quick a motion as I was capable of, I seized it in my hand. The poor fellow probably supposed from slothful my motions that I had no designs on his person, or if I had that he could easily escape me.

Louis. I could not have conjectured that an animal of so soldier-like an appearance carried no arms. The common antipathy to the dragon-fly is, I suppose, one example of the injustice often done by public opinion.

Father. Its fierce and martial aspect is well calculated to excite prejudice against it; though in reality it is one of the most harmless, and at the same time, one of the most interesting in its history of all insects.

Louis. I am satisfied now that it is not such an evil omen as I believed. But still I know there are snakes here, because I saw a fool hardy boy the other day carrying one away in his hand.

John. Why, would you call him fool hardy, if the snake were innocent?

Louis. I know it was not innocent, for it darted its sting from its mouth incessantly.—You laugh, but my eyes can't deceive me. It had a regular two-forked sting.

John. I am only a novice in snakeology, but I know better than that. You have mistaken its tongue for a sting, brother.

Louis. A snake's tongue, with two prongs! John, there is no knowing whether you joke or not. I appeal to father.

Father. You are wrong, my son, in supposing a snake to have a sting. It has a long forked tongue, which it can thrust forth very quickly, to catch its prey.

Louis. I wonder that did not occur to me. I have many a time watched the frogs which promenade every evening about our yard door, catching flies in that way, or at least I presume it is in the same way.

Father. Precisely.—The wound which a snake inflicts proceeds from its fangs, or teeth. These are in the upper jaw, and in the venomous species have a bag of poison at the root, from which the poison is expressed into the wound. The one you saw, however, could not have been a poisonous one. These are very rare in our part of the country, so that the dread of serpents is not so rational as you supposed.

Louis. I have often heard of persons being bit by snakes along this creek.

Father. Such accounts are apt to be false. I do not recollect that I have ever seen a single individual injured by a snake in this section of country. In some desolate places in New Jersey, rattle snakes are occasionally found; and the *copperhead* has been seen perhaps two or three times about the streams west of the Delaware, within as many years. These are the only poisonous kinds that exist in this region; and, as I said before, they are so scarce that I never knew of a person being bit by them.

Louis. According to that statement, one is in greater danger from mad dogs than from snakes.

Father. No doubt of it. The common practice of killing snakes is a foolish and barbarous one. You might with more reason kill every dog you meet with; for you are more likely to be bit by a mad dog than by a noxious serpent.

John. I saw an account in a newspaper a few days ago of some men who routed a congregation of blacksnakes, and killed them all, amounting to nearly two hundred. It struck me at the time that the men were great ignoramuses or fools. The animals would never have done any thing worse than to devour a few flies and toads.

Louis. You remind me of a laughable incident which I once witnessed in a harvest field. One of the workmen had secured with his hayfork, what he supposed was a snake; but he soon discovered something very peculiar in the construction of its head. The whole corps of honest men were called to see the monster, and preparations were on foot to preserve him alive, for the inspection of Dr. Mitchell. Meanwhile a change came over the features of the animal, and his head apparently stretched forward and dropped off. We then discovered nothing left but a common snake, which had just spit a toad out of its mouth. The toad had disappeared when the animal was first seized, except its head and two fore legs, which gave a grotesque appearance to the compound looking creature.

Father. It is surprising to observe what large bodies will pass through the throat of a snake. They cannot masticate their food, and must swallow their prey entire. Their throat distends enormously, and allows its gradual passage. Being as slow to digest their food as they are to swallow it, a single meal lasts them a long time.—What curiosity have you found, John?

John. Here is a cluster of flowers, on which a fly appears to be detained prisoner against its will. One of its legs seems glued fast.

Father. That is well worthy of your attentive examination. The leg of the fly, you will observe, is not glued to the flower, but pinched fast by the closing of the parts belonging to the flower. The plant is an Asclepias, of which there are eight or ten species, natives of the middle states, known commonly by the name of silk weed, wild cotton, butterfly weed &c. Several of them possess this property. The flower has a number of little columns in its centre, surrounding the nectary, or reservoir of honey. These columns are sensitive, and whenever a fly attempts to rifle the honey, or accidentally gets his foot between them, they contract and hold him fast, often till he starves to death.

Louis. Do you suppose the flower possesses sensation, or that it feels, properly speaking, the irritation of the insect?

Father. That inquiry would lead us into a long dissertation, for which we have not time at present. If you remind me of it, I will offer you an explanation of the phenomenon at some future time.

Q.

MISCELLANIES.

1. *Iron Houses.*—A writer in a late journal, refers to the increasing abundance and cheapness of iron, as indicating its application, at no very remote period, as a material for the construction of houses: We may be allowed to follow up the idea, and talk of iron paving stones, iron turnpikes, iron tables and chairs, and the like. Our children of the coming iron age, will laugh at the time-worn edifices of stone and wood, which will then be so many Babels to commemorate the folly of their fathers.

2. *Cheap Living.*—A newspaper says, "Samuel M. Hopkins, L. L. D. of Albany, calculates that two cents and seven mills per day will furnish healthy and comfortable food for a man, and include bread, pudding, meat and jelly, potatoes, salt, vinegar, pepper, rye coffee, and molasses!" Truly, the establishment of an eating house on such a plan, seems like a good speculation for capitalists. He might charge 100 per cent. profit! Jesting aside, however, few persons who have not made the calculation are aware of the little expense which a man need incur to procure food sufficient to supply his necessities. We have always believed that there are more complaints about starving for bread in our country than are prompted by absolute necessity.

3. *Luscious repast.*—Whose mouth will fail to water, after perusing the following account of an exquisite, but savage dish?—The inhabitants of Alaska, when they catch a seal, bury it under the grass in summer, and the snow in winter, and eat the half frozen, half putrid flesh, with as keen a relish as the European finds in his greatest dainties. (*Crantz Hist. of Greenland.*) They drink the blood of the seal while warm, and eat dried herrings moistened with whale oil. They mix fresh, putrid, and half incubated eggs, whortleberries, and angelica, in a bag of seal skin, pour whale blubber on it, and reserve the exquisite mixture as a delicacy for the winter. They always dispose of the whales stranded on their coast, not desisting from their feast, however far putrefaction may have proceeded, till the whole is gone.

4. *Important hint to youngsters.*—A stout, healthy, energetic and tractable country chap, not much less than 15 years old, and one that knows how to read, will be received in the office of the Advocate of Science, as an apprentice to the printing business. Testimonials of a good character will be required.

AGENTS.

BRISTOL, Pa.—*Anthony Swain.*
FRANKFORD. Pa.—*John Griscom.*
MOUNT HOLLY, N. J.—*Samuel Bullock.*
MORRISVILLE P. O. Pa.—*Hector C. Ivins.*
POTTSVILLE, Pa.—*Elihu Pedrick.*